Interoperability that Works: Integrating the Healthcare Enterprise

May 2011

Interoperability: From a problem to a solution

Base Standards  Profile Development & testing  eHealth Projects

Profiling Organizations are well established
Standards Adoption Process

Identify available standards (e.g. HL7, DICOM, IETF, OASIS)

Document Use Case Requirements

Develop technical specifications

Testing at Connectathons

IHE Demonstrations

Products with IHE

Timely access to information

Easy to integrate products

The IHE Development Domains

13 Years of Steady Evolution 1998 – 2011

Pharmacy
since 2009

Cardiology
since 2004

Pathology
since 2006

Laboratory
since 2004

Radiology
since 1998

Eye Care
since 2006

Radiation Oncology
since 2004

Patient Care Devices
since 2005

Quality
Research & Public Health
since 2006

Patient Care Coordination
since 2004

IT Infrastructure
since 2003

Continua
since 2008
International Growth of IHE

- Local Deployment, National Extensions
- Promotional & Live Demonstration Events
- Over 400 Organizational Members (see www.ihe.net/governance)

What is IHE, how much adopted?

- ISO TR28380 Global Standards Adoption – IHE Process and Profiles
- Home Health: CONTINUA and IHE work together.
- Widespread adoption of IHE Profiles by National and Regional Projects around the world:
  - US Nationwide Health Information Network (NwHIN) leverages IHE profiles (XCA, XDR, XCPD, BPPC, ATNA)
  - 23 Country European epSOS Project: IHE-Europe hosting Industry Team, support project interoperability conformance testing (XCA, XCPD, ATNA, XUA, BPPC, CDA Content Modules from PCC).
  - In use in several national and regional projects: Austria, France, South Africa, Italy, Netherlands, USA, Japan, Switzerland, Canada
  - EU Commission eHealth Interop Mandate 403 and HITCH roadmap conformance testing leverage IHE process
Interoperability Testing Needs an Ecosystem

- Identify available standards (e.g. HL7, DICOM, IETF, OASIS)
- Develop technical specifications
- Document Use Case Requirements
- Testing at Connectathons
- IHE Demonstrations
- Products with IHE
- Timely access to information
- Easy to integrate products

IHE Connectathon

- Open invitation to vendor and other implementers community
- Advanced testing tools (GAZELLE)
- Testing organized and supervised by project management team
- Thousands of cross-vendor tests performed
- Results recorded and published. Over 400 Health IT and Systems companies passed:
  http://connectathon-results.ihe-europe.net
IHE Connectathons

2011 Connectathon:
Chicago, USA, January 17-21
Pisa, ITALY, April 11-15
Australia, July
Japan, October

Massive yearly events:
70-80 vendors
250-300 engineers
100-150 systems
...integrated in 5 days

Interoperability Procurement

A Profile specifies (by references to standards) what is exchanged “on the wire” between called actors (e.g. 1,2,3)

For each systems procured:
1 - Specify the Profile/Actors to be supported
2 - Ask for the vendors IHE Integration Statement (declares Profile/Actors)
3 – Ask for a declaration that the Actor/Profile implemented tested at an IHE Connectathon (check vendor is on the IHE Product Registry).
4 – Place contractual commitments
Interoperability: From a problem to a policy

Countries/Regions with such a process:
- Austria (ELGA, Regions)
- France (ASIP)
- USA (NwHIN)
- Italy (Paesini, etc.)
- China (MoH)
- Switzerland (eHealth Suisse)
- Canada (Infoway)

Simple and Effective Profile Recognition Process & Policy

Profile A
Profile B
Profile C

Leverage Synergies of Global Standards and Profiles

Interoperability: From a problem to a policy

IHE- Roles of Different levels

International Governance

Global Profile Development
- Radiology
- Cardiology
- Radiation Oncology
- Patient Care
- IT Infrastructure
- Patient Care Coordination
- Oncology Devices
- Public Health, Quality and Research
- Laboratory
- Pathology
- Eye Care
- Pharmacy

Regional Profile Deployment
- IHE America
- Canada
- USA
- Korea
- Taiwan
- Japan
- IHE Asia-Oceania
- China
- Australia
- IHE Europe & Middle East
- Austria
- Germany
- Netherlands
- Turkey
- Italy
- France
- Spain
- UK
- Switzerland

Open to all Stakeholders

National Engagement Projects

IHE Saudi ?
eHealth and Interoperability:
Key IHE Profiles for national interoperability

Registering Health Records: IHE-XDS

Community

Hospital Record
Clinic Record
Specialist Record

Repository of Documents

I-Reference to records

Clinical IT System

Index of patients records

Clinical Encounter

Health Info Exchange
Access to Shared Records: IHE-XDS

4-Patient data presented to Physician

3-Records Returned

Repository of Documents

Repository of Documents

Community

Hospital Record

Clinic Record

Specialist Record

Clinic Encounter

Aggregate Patient Info

HIE

IT Infrastructure – Sharing Records

Region A

Region B

Region C

XDS Registry & Repository

PDQ

XCA

XDS

XDS

XDS

Patient Registry

XDS

PDQ

XCPD

XCA

XCA

PDQ

XCPD
XDS and related Profiles extend deployment:

- Off-the shelf sharing of records/documents. All type of clinical content (e.g. HL7 CDA/CCD).
- Robust service: submission sets, replace/amend, etc.
- Open source and support by well over 100 products (infrastructure & EPRs).
- Projects range from communities (a few hospitals/clinics) to regions and nations. Now a few registries/repositories with more than 1 million patients.
- Implementation feedback is positive: moving beyond interfacing to user experience.

Implementing IHE today in Regional and National Health Networks: Most Popular Services

- Sharing of Patient Summaries (Incl Prescriptions)
- Sharing of Laboratory Results
- Sharing of Imaging Info
- Sharing of Cardiology Info
- Sharing of Scanned Docs
- Sharing of Documents
  - Point-to-Point Push(XDR), Sharing(XDS), Federated(XCA), Media and e-mail(XDM)
- Audit Trail and Secured Connection
- Digital Signature
- Privacy and Consent
- Patient Identification Mgt
- Provider Directory
- Terminology Services

IHE Content Profiles

IHE IT Infrastructure Profiles
Principles for a Regional/National eHealth Network

1. Set a standards based boundaries with stable/proven/unambiguous interoperability specifications (profiles of well accepted standards):

   - Create your own boundary or leverage IHE profiles?
   - IHE Profiles come with testing tools, process, shared experience, open source, a broader community, multi-vendor and stability

2. Keep things simple and robust within the standards-based boundary (365x24 availability, costs, new use cases, etc.).

Countries and approaches

<table>
<thead>
<tr>
<th>Countries</th>
<th>Data Messaging</th>
<th>Document Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>Abandoned</td>
<td>CDA</td>
</tr>
<tr>
<td>Austria</td>
<td>XDS+CDA</td>
<td>Operational since 2009. Used as XDS transport with XDS, designed in 2006. Similar to XDS transactions with customized HL7 V3 messages.</td>
</tr>
<tr>
<td>Turkey</td>
<td>CDA</td>
<td>Mainly data reporting to Ministry. Transport (HL7 V3 customised by Turkey), documents (HL7 V3) for content.</td>
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<tr>
<td>Canada</td>
<td>XDS+DICOM</td>
<td>Early deployments in a few provinces. Transport and content HL7 V3. Use XDS for Imaging.</td>
</tr>
<tr>
<td>France</td>
<td>XDS+CDA</td>
<td>Early deployments nation-wide. HL7 CDA Documents for content and XDS for transport.</td>
</tr>
<tr>
<td>USA</td>
<td>XCA+CDA</td>
<td>Nationwide Health information Network. In use today between Kaiser, VA, SSA, Virginia, Federal, etc.</td>
</tr>
<tr>
<td>Switzerland</td>
<td>XDS+CDA</td>
<td>Documents (HL7 CDA) used for content. Transport uses XDS as national standard. Deployed in city of Geneva (University Hospital leadership).</td>
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<tr>
<td>Cross-Border Europe</td>
<td>XCA+CDA</td>
<td>epSOS Project – Uses HL7 CDA document for content with XCA. Testing of 13 participating nations at IHE-Europe Connectathon April 2011: France, Germany, Switzerland, Spain, Italy, Austria, Slovenia, Turkey, Portugal, Denmark, Sweden, Czech Republic, Slovakia.</td>
</tr>
<tr>
<td>Regions:</td>
<td>XDS+CDA</td>
<td></td>
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<tr>
<td></td>
<td>XDS+DICOM</td>
<td>Italy, Belgium, Netherlands, USA, China, South Africa</td>
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IHE, Global Standards-Based Profiles Adopted in National & Regional Projects (sample)

Quebec, Toronto, Alberta, British Columbia, Canada Infoway

Italy, CNGS, Veneto, Friuli

THINC, New York

NCHICA - N. Carolina

Italy, Conto Corrente, Veneto, Friuli

Boston Medical Center - MA

Philadelphia HIE

VITL, Vermont

CareSpark - TN & VA

KEYHIE, Pennsylvania

For more complete list see: tinyurl.com/wwXDS

IHE based “Interoperability” experience has demonstrated significant benefits to national and regional programs:

- Reduce specification consensus time
- Simplify implementation efforts
- Reuse of testing tools and processes
- Shared implementation experience
Providers and Vendors
Working Together to Deliver
Interoperable Health Information Systems
in the Enterprise
and Across Care Settings

http://www.ihe.net